Lake Michigan Fishery Update

Answering the most Frequently-Asked-Questions about Lake Michigan's fishery

1. **What is going on with salmon in Lake Michigan?**
   The current status of salmon is that the population is down approximately about 75% from the peak in 2012. The decline can be attributed to two factors: (1) the DNR has reduced stocking rates since 1999 while maintaining higher possession limits since 2005, and (2) natural reproduction and recruitment of salmon has declined substantially since 2013 because there is less prey in the lake.

2. **Why is the DNR managing for less salmon in Lake Michigan?**
   DNR recognizes that salmon populations are highly stressed because alewives, their primary prey, have been declining since the mid-1990s and have never stabilized since the start of the decline. Alewives are declining because they are being out-competed by zebra and quagga mussels for the same nutrients in the lake (zebra and quagga mussels invaded the Great Lakes in the mid-1990s). Also, high stocking rates by state agencies responsible for managing Lake Michigan in the early 1990s led to very high predation on an already unstable alewife population. The combination of increased salmon predation and the competition from zebra and quagga mussels squeezed the alewife population from the top and bottom and was likely the reason we saw salmon crash in Lake Huron in the mid-2000s.

3. **Will Lake Michigan follow Lake Huron?**
   DNR biologists do not want Lake Michigan to follow the same path as Lake Huron. That is why DNR fisheries staff worked with Lake Michigan anglers to reduce annual stocking levels from 7 million to 2.5 million Chinook salmon through coordinated lakewide stocking cuts in 1999, 2006 and 2013. These reduced stocking levels have helped to decrease the predation pressure on alewife by salmon. Additionally, the DNR has maintained higher possession limits in an attempt to use angling as another method to relieve even more predation pressure on alewives.

4. **Will the stocking cuts and possession limits be enough?**
   In theory, populations are most stable when there is enough prey to feed all the predators. If predators become too abundant and prey too scarce, then predators will eat all the prey, starve and not survive. Stocking cuts and possession limits only work if they reduce predators in the lake to levels that prey can sustain. But what if prey continues to decrease no matter how few predators are out there?

   This is the question DNR biologists are focusing on right now. Fisheries management agencies do not have ability to directly influence the number of alewives in Lake Michigan but can only indirectly affect pressure by reducing predation. DNR can, however, apply new approaches for assessing the salmon and alewife balance through population modeling. The modeling allows us to utilize all of the available data on fish populations, produce estimates of absolute

abundance of salmon and alewives, and ultimately determine the exact ratio of predator to prey. DNR biologists believe the only way to keep Lake Michigan from following Lake Huron is to manage the fisheries by balancing predator (salmon) and prey (alewife) so neither collapse.

5. **What about the other predators?**
   In addition to Chinook salmon, the Lake Michigan fishery is supplemented by stockings of brown trout, coho salmon, steelhead, and lake trout. Although the primary prey for Chinook salmon is alewives, the other predators have a much more diverse diet. Since the introduction of zebra and quagga mussels, the round goby has established abundant populations in the Great Lakes. Round gobies are able to consume mussels and can spawn multiple times in a single season. In Lake Michigan specifically, the abundance of round gobies has skyrocketed, and they are now being eaten by almost every predator, except Chinook salmon. Therefore, reductions in stocking levels for other predators may not be as effective for reducing alewife consumption if the prey consumed is mostly gobies. In addition, we manage for a diversity of both prey and predators in the Lake Michigan fishery.

6. **How abundant are the gobies in Lake Michigan?**
   It has been suggested that they are the top prey species in Lake Michigan today and may have reached levels comparable to alewives when they were at their peak levels in the 1960s and 1970s. However, the absolute abundance of gobies is hard to estimate because of their patchy distribution (they prefer rocky habitats), their reproductive strategy (they spawn multiple times in a year), and because their mortality rates are very high (the population of gobies changes substantially throughout the year). What we do know is that they are being consumed at a high rate by most of the other predators.

7. **Why won't Chinook salmon eat gobies?**
   Chinook salmon are biologically designed to feed on open-water prey such as alewives. They are not, however, designed to feed on the bottom. In the 20+ years of dissecting the stomach contents of Chinook salmon in Lake Michigan, the DNR has only found two instances where gobies were consumed by Chinook salmon and it was less than 1% of the diet composition.

8. **What will the 2015 Lake Michigan fishery look like?**
   There will be lower Chinook salmon catch rates but more diverse fisheries represented. Brown trout, steelhead, and lake trout catch rates should increase. Nearshore predators, such as bass, walleye, and pike will increase. Even nearshore species such as rock bass and yellow perch will benefit from the goby buffet.

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